

REMARKS

Applicants intend this response to be a complete response to the Examiner's Non-Final Office Action. Applicant has labeled the paragraphs in his response to correspond to the paragraph labeling in the Office Action for the convenience of the Examiner.

DETAILED ACTION

Specification

The disclosure stands objected to because of the following informalities:

The Examiner contends as follows:

Paragraph [0092] recites "here are many different physical configurations". Examiner believes "here" should be amended to read - There--.

Paragraph [0120] recites "two". Examiner believes "two" should be changed to - to--.

Paragraph [0138] line 6 recites "holler". Examiner believes "hoffer" should be changed to - hotter --.

Appropriate correction is requested.

Applicants have amended paragraphs [0092], [0120] and [0138] to make the requested corrections and respectfully requests withdrawal of this objection.

Claim Rejections - 35 USC § 112

Claims 5, 8, 9, and 11 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The Examiner contends as follows:

Claims 5, 8, 9, 11 recite "wherein the steps are performed in any order". Examiner notes that claim 1 also includes a method step, therefore examiner is unsure as to which steps are being referred to by claim 5. Are the steps just for claim 4, or the combination of claim 1 and 4. Examiner also notes that the step of irradiating the column with microwave energy must inherently precede the step of holding the chromatography column at a desired temperature, therefore the steps cannot be performed in any order as claimed.

Applicants have canceled claims 5, 8-9 and 11 rendering this rejection moot. Applicants, therefore respectfully request withdrawal of this section 112 rejection.

Claims 14,15, and 17 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite in that it fails to point out what is included or excluded by the claim language.

The Examiner contends as follows:

This claim is an omnibus type claim.

Applicants have amended claims 14, 15 and 17 to represent a combination of negative, positive and holds to achieve a desired separation efficiency as clearly enabled in the specification. Applicants, therefore, respectfully request withdrawal of this second 112 rejection.

Claim Rejections - 35 USC § 101

Claims 12-17 stand rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

The Examiner contends as follows:

Claims 12 and 16 recite "A GC separation protocol for a microwave heated GC apparatus". Examiner notes the definition of protocol is "is a set of guidelines for use in various circumstances". Examiner respectfully submits that statutory subject matter falls into the categories of a method, apparatus or structure, product, composition of matter, or improvement thereof. Examiner respectfully submits that a "protocol" fails to fall within the listed categories of statutory subject matter. Someone of ordinary skill in the art would not be able to properly determine the metes and bounds of the claimed "protocol". Examiner suggests rewording the claim to clearly fall within the "method" or apparatus or structure" categories of statutory subject matter. Claims 13-15 depend on claim 12 and hence are also rejected. Claim 17 depends on claim 16 and hence is also rejected.

Applicants canceled claim 12, 13, and 16 and new independent claims 18, 26, 34, 41 and 49, which are all in the form of a method including specific method steps. Since the claims are now methods for separating components, Applicants respectfully request withdrawal of this section 101 rejection.

Claim Rejections - 35 USC § 102

Claims 1-5 stand rejected under 35 U.S.C. 102(b) as being clearly anticipated by Rounbehler et al (5808178).

The Examiner contends as follows:

Rounbehler et al teaches a method for improving separation efficiencies comprising the step of supplying, to a chromatography column(110), a gaseous coolant (cold air or boiled off liquid nitrogen; column 14 lines 47-59) at a sufficient flow rate and at a sufficient temperature to produce a negative temperature ramp(figure 17) in the column, wherein the column includes a continuous phase material(105) forming a wall surrounding an interior space for containing a chromatography sample, and a microwave absorbing material(column 13 lines 37-45) contained in the continuous phase material, where the chromatography column has a loss factor sufficient to absorb at least 50% of the microwave energy

transmitted into the microwave heating apparatus and wherein the negative temperature ramp improves the separation of lower boiling components from higher boiling components or the improvement of the separation of components having boiling points within a narrow temperature range. Rounbehler et al further teaches irradiating the chromatography column with microwave energy sufficient to produce a desired positive temperature ramp (figure 17). Rounbehler et al further teaches holding the chromatography column at a desired temperature and time by supplying sufficient coolant flow at a sufficient temperature and irradiating the column with sufficient microwave energy to hold the column at the desired temperature for the desired time (column 14 lines 20-24).

Rounbehler does not disclose a GC column comprising a continuous phase material forming a wall surrounding an interior space for containing a chromatography sample and a microwave absorbing material contained in the continuous phase material. Thus, Rounbehler cannot anticipate new claims 18-25 and Applicants respectfully request withdrawal of this section 102(b) rejection.

Claims 6-9 stand rejected under 35 U.S.C. 102(b) as being clearly anticipated by Rounbehler et al (5808178).

The Examiner contends as follows:

Rounbehler et al teaches a method for improving separation efficiencies comprising the step of irradiating a chromatography column (110) including a continuous phase material forming a wall surrounding an interior space for containing a chromatography sample, and a microwave absorbing material (column 13 lines 37-45) contained in the continuous phase material, where the chromatography column has a loss factor sufficient to absorb at least 50% of the microwave energy transmitted into the microwave heating apparatus to produce a desired temperature ramp, and supplying to the chromatography column (110), a gaseous coolant (cold air or boiled off liquid nitrogen; column 14 lines 47-59) at a sufficient flow rate and at a sufficient temperature to produce a negative temperature ramp (figure 17) in the column, wherein the negative temperature ramp improves the separation of lower boiling components from higher boiling components or the improvement of the separation of components having boiling points within a narrow temperature range.

Rounbehler et al further teaches holding the chromatography column at a desired temperature and time by supplying sufficient coolant flow at a sufficient temperature and irradiating the column with sufficient microwave energy to hold the column at the desired temperature for the desired time (column 14 lines 20-24).

Rounbehler does not disclose a GC column comprising a continuous phase material forming a wall surrounding an interior space for containing a chromatography sample and a microwave absorbing material contained in the continuous phase material. Thus, Rounbehler cannot anticipate new claims 26-33 and Applicants respectfully request withdrawal of this section 102(b) rejection.

Claims 10 and 11 stand rejected under 35 U.S.C. 102(b) as being clearly anticipated by Rounbehler et al(5808178).

The Examiner contends as follows:

Rounbehler et al teaches a method for improving separation efficiencies comprising the step of irradiating a chromatography column(110) including a continuous phase material forming a wall surrounding an interior space for containing a chromatography sample, and a microwave absorbing material(column 13 lines 37-45) contained in the continuous phase material, where the chromatography column has a loss factor sufficient to absorb at least 50% of the microwave energy transmitted into the microwave heating apparatus to produce a desired temperature ramp, and supplying to the chromatography column(110), a gaseous coolant(cold air or boiled off liquid nitrogen; column 14 lines 47-59) at a sufficient flow rate and at a sufficient temperature to produce a negative temperature ramp(figure 17) in the column, wherein the negative temperature ramp improves the separation of lower boiling components from higher boiling components or the improvement of the separation of components having boiling points within a narrow temperature range, and holding the chromatography column at a desired temperature and time by supplying sufficient coolant flow at a sufficient temperature and irradiating the column with sufficient microwave energy to hold the column at the desired temperature for the desired time(column 14 lines 20-24).

Rounbehler does not disclose a GC column comprising a continuous phase material forming a wall surrounding an interior space for containing a chromatography sample and a microwave absorbing material contained in the continuous phase material. Thus, Rounbehler cannot anticipate new claims 34-40 and Applicants respectfully request withdrawal of this section 102(b) rejection.

Claims 12-15 stand rejected under 35 U.S.C. 102(b) as being clearly anticipated by Rounbehler et al(5808178).

The Examiner contends as follows:

Rounbehler et al teaches a GC separation protocol for a microwave heated GC apparatus comprising at least one positive temperature ramp and at least one negative temperature ramp(figure 17), where the positive temperature ramp is produced by irradiating a column which includes a continuous phase material forming a wall surrounding an interior space for containing a chromatography sample, and a microwave absorbing material(column 13 lines 37-45) contained in the continuous phase material, where the chromatography column has a loss factor sufficient to absorb at least 50% of the microwave energy transmitted into the microwave heating apparatus and wherein the negative temperature ramp is produced by supplying gaseous coolant to the column(cold air or boiled off liquid nitrogen; column 14 lines 47-59) at a flow rate and at a temperature sufficient to produce one or more desired negative temperature ramps: Rounbehler et al further teaches at least

one hold, wherein the column is maintained at a desired temperature and for a desired time by supplying either coolant and/or a combination of coolant and microwave energy to the column.

Examiner notes that the above rejection is based on the prior art reference teaching all of the limitations of the body of the claim, wherein the examiner has determined that the prior art reference teaches a "protocol".

Rounbehler does not disclose a GC column comprising a continuous phase material forming a wall surrounding an interior space for containing a chromatography sample and a microwave absorbing material contained in the continuous phase material. Thus, Rounbehler cannot anticipate new claims 41-48 and Applicants respectfully request withdrawal of this section 102(b) rejection.

Claims 16 and 17 stand rejected under 35 U.S.C. 102(b) as being clearly anticipated by Rounbehler et al(5808178).

The Examiner contends as follows:

Rounbehler et al teaches a GC separation protocol for a microwave heated GC apparatus comprising one or a plurality of positive temperature ramps, one or a plurality of holds, and one or a plurality of negative temperature ramp (figure 17), where each positive temperature ramp is produced by irradiating a column which includes a continuous phase material forming a wall surrounding an interior space for containing a chromatography sample, and a microwave absorbing material (column 13 lines 37-45) contained in the continuous phase material, where the chromatography column has a loss factor sufficient to absorb at least 50% of the microwave energy transmitted into the microwave heating apparatus and wherein each negative temperature ramp is produced by supplying gaseous coolant to the column (cold air or boiled off liquid nitrogen; column 14 lines 47-59) at a flow rate and at a temperature sufficient to produce one or more desired negative temperature ramps.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Walters et al(5939614) teaches a chromatographic column using microwave energy for heating and a microwave absorbing material for absorbing microwave energy to assist in the heating process.

Rounbehler does not disclose a GC column comprising a continuous phase material forming a wall surrounding an interior space for containing a chromatography sample and a microwave absorbing material contained in the continuous phase material. Thus, Rounbehler cannot anticipate new claims 49-55 and Applicants respectfully request withdrawal of this section 102(b) rejection.

Having fully responded to the Examiner's Non-Final Office Action, Applicant respectfully urges that application be passed onto allowance.

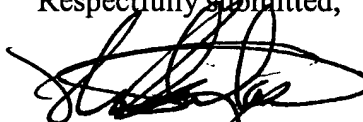
Applicants have attached a check in the amount of \$2070 including a 3 month extension fee of \$1020 and additional claim charges of \$1050 (\$50×21).

The Commissioner is authorized to charge any additional fees or credit any overpayments to Deposit Account Number 501518.

If it would be of assistance in resolving any issues in this application, the Examiner is kindly invited to contact applicant's attorney Robert W. Strozier at 713.977.7000

Date: October 10, 2006

Respectfully submitted,



Robert W. Strozier
Reg. No. 34,024